June X, 2018

Brick Spangler
Environmental Program Manager
Port of Seattle
PO Box 1209
Seattle, WA 98111

Re: US Environmental Protection Agency Approval with Modifications – Final Feasibility Study, Supplemental Remedial Investigation/Feasibility Study, East Waterway Operable Unit, Harbor Island Superfund Site, Seattle, WA.

Dear Brick,

The U.S. Environmental Protection Agency (EPA) has reviewed the Final Feasibility Study, submitted by the Port of Seattle on November 3, 2017 as part of the Supplemental Remedial Investigation and Feasibility Study for the East Waterway Operable Unit of the Harbor Island Superfund Site. EPA approves this document with the modifications described on the attached tables.

EPA is requiring removal of all references to the Washington State Department of Ecology (Ecology) natural background and practical quantitation limit values. These values are not applicable or relevant and appropriate requirements (ARARs) and therefore are not appropriate in an EPA document. Discussion of Ecology guidance for calculating these values is also not relevant and must be removed.

We are also requiring significant revisions to Appendix A Part 1 "Compliance with Sediment Management Standards" (SMS) in order to implement the required revisions as described above.

EPA is also requiring the recalculation of cancer and non-cancer risks for cPAHs based on the revised IRIS toxicity values for benzo[*a*]pyrene released in 2017. This includes making the appropriate changes to text, tables, and figures in Section 3 and any other affected sections of the FS. If changes result in the cancer risk dropping below 10^{-6} for a given pathway, contact EPA to determine whether changes in remedial action objectives or preliminary remediation goals/remedial action levels may be required.

Within XX days upon receipt of these revisions, a final version of the East Waterway Feasibility Study needs to be submitted to EPA. Should you have any questions, I can be contacted at 206-553-4092, or by email at sanga.ravi@epa.gov. Inquiries of a legal nature should be sent to XXX at ### or <email>.

Sincerely,

Ravi N. Sanga
Remedial Project Manger
Remedial Cleanup Program
Site Cleanup Unit 3

Cc:

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Required Revisions to the Final Feasibility Study

Required Revisions Remaining from the Draft-Final Feasibility Study					
Comment #	**Section #**	**Page #**	**Original Comment**	**EWG Response**	**Required Revision**
12	General		Capping should not be used in areas that would require the use of armoring to prevent scour. If scour protection is considered then mitigation of lost habitat needs to be added to the cost estimate.	All caps will have armor layers as necessary. Caps will be covered with "fish mix" or similarly suitable habitat material as required. Clarification was added to Section 7.2.5.1. Habitat was already listed as a consideration in Section 8.1.2.2 and Appendix D, Part 2 (Section 2).	The revisions made were not sufficient to address the original comment. Make the following changes: §7.2.5.1; pg. 7-18 "The surface layer of caps in intertidal areas are expected to contain suitable substrate to support benthic organism and fish communities ~~including clams~~." §8.1.2.2; pg. 8-13 "The cap design will be further refined in remedial design, and could include the use of thinner caps amended with sorptive or reactive materials where needed to meet breakthrough performance requirements, ~~and~~ refinement of location-specific propwash forces and armoring needs, and a surface habitat layer to support benthic organism and fish communities."
42	ES	9	Make to following addition: "Excess Cancer Risk refers to the additional risk of developing cancer due to exposure to a toxic substance incurred over a defined exposure period in this case lifetime exposure."	Added	Revision was not made. Make the following change: "Excess Cancer Risk refers to the additional risk of developing cancer due to exposure to a toxic substance incurred over a defined exposure period in this case lifetime exposure."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
1	Executive Summary; Table 1	13	Remove table footnote a.
2	Executive Summary; Table 1	13	Remove footnote 5.
3	Executive Summary; Table 1	13	Remove the definitions for "PQL" and "SCUM"
4	List of Acronyms and Abbreviations	xviii to xxiii	Remove the entries for "90/90 UTL" and "SCUM".
5	1.4.2	1-9	Remove the 90/90 UTL definition.
6	2.10.4	2-22	Make the following changes to the end of the second paragraph: "The upstream contributions and lateral input data are further evaluated in Section 5 and are used to estimate net incoming solids concentrations for the purposes of the recontamination evaluation. ~~In addition, the upstream contributions and lateral inputs are used in Appendix A. to evaluate the technical possibility of achieving natural background-based PRGs~~."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
7	3.2 and associated subsections and tables	3-9	Recalculate cancer and non-cancer risks for cPAHs using the recent (2017) IRIS update for benzo[*a*]pyrene. This includes incorporating where appropriate the revised/new oral cancer slope factor, inhalation unit risk, non-cancer oral reference dose, and the inhalation reference concentration. Modify text, tables, and figures to reflect the revised cancer and non-cancer risk values.
8	Table 4-1	4-3	For the Fish Tissue Quality / Federal cell: Remove this citation. The CFR cited is incorrect and EPA could not locate an appropriate FDA regulation ARAR.
9	Table 4-1	4-3	For the Surface Water Quality / State cell, change: "Surface Water Quality Standards (RCW ~~90.48~~90.48, WAC 173-201A)"
10	Table 4-1	4-3	For the Waste Treatment Storage and Disposal / Federal cell, change: "RCRA (42 USC ~~7401-7642~~6901-6992k; 40 CFR ~~264 and 265~~260-279~~; 42 USC 6901-92k~~)"
11	Table 4-1	4-3	For the Waste Treatment Storage and Disposal / State cell, change: "Dangerous Waste Regulations (RCW 70.~~107~~105; WAC ~~173-60-040-050~~173-303)"
12	Table 4-1	4-3	For the Discharge of dredged/fill material… / Federal cell, change: "Clean Water Act (Sections 401, 404; 33 USC ~~1251-1384~~1341, 1344; 40 CFR ~~232, 231, 404~~121.2, 230, 231; 33 CFR ~~320-330~~320, 322-3, 328-30); Rivers and Harbors Act (33 USC 401 et seq)"
13	Table 4-1	4-3	For the Discharge of dredged/fill material… / State cell, change: "Hydraulic Code Rules (RCW 75.~~55~~65; WAC 220-110)"
14	Table 4-1	4-3	For the Open-water disposal… / State cell, change: "Dredged Material Management Program (RCW ~~79.90~~79.105.500; WAC 332-30-166 (3))"
15	Table 4-1	4-3	For the Critical (or Sensitive) Area / State cell, change: "Growth Management Act (RCW ~~37.70a~~36.70A)"
16	Table 4-1	4-3	For the Habitat for Fish, Plants, or Birds / Federal cell, change: "Clean Water Act (Section 404(b)(1)); U.S. Fish and Wildlife Mitigation Policy (~~44 CFR 7644~~81 Fed. Reg. 83440, Nov. 21, 2016); U.S. Fish and Wildlife Coordination Act (16 USC 661 et seq); Migratory Bird Treaty Act (16 USC 703-712)"
17	4.3.1	4-15	As discussed at the October 20, 2017 meeting with EWG, make the following change to the second paragraph: "The CSL (higher) risk-based values are based on an estimated lifetime excess risk of less than or equal to 1 x 10^{-5} for individual carcinogens, and the same as the SCO for multiple carcinogens or exposure pathways, and non-carcinogens. ~~The SCLs for RAOs 1 and 2 are set to the SCO and applied over appropriate exposure areas (i.e., site wide for seafood consumption and netfishing exposure scenarios and clamming areas for tribal clamming scenarios).~~"
18	4.3.1	4-15	Make the following revisions to Footnote 38: "The SMS define "technically possible" as "capable of being designed, constructed and implemented in a reliable and effective manner, regardless of cost." WAC 173-204-505(23). ~~Ecology guidance, provided in the Sediment Cleanup Users Manual (SCUM) II (Ecology 2017), confirms that this definition includes both the ability to attain, and to reliably and effectively maintain, the natural background cleanup level by stating that upward adjustment of the cleanup level should be based on "whether it is technically possible to achieve and maintain the cleanup level at the applicable point of compliance." [SCUM II 7.2.3.1, page 7-4].~~"
19	4.3.1	4-15	Make the following changes to Footnote 39: "~~However,~~ EPA disagrees with the statistical method used by Ecology to determine natural background concentrations."
20	4.3.1	4-16	Make the following change: "Following completion of source control and remediation efforts, remaining surface sediments in the EW OU are not currently predicted to attain all natural background- ~~or PQL~~ based PRGs for protection of human health for seafood consumption (RAO 1), due to model input parameters that assume ongoing contribution of contaminants from diffuse, non-point sources upstream of the EW."
21	4.3.1	4-16	For clarity, make the following changes to the second paragraph: "However, ~~CERCLA~~ compliance with MTCA/SMS ARARs may be attained or waived through one or more of the following pathways:"

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
22	4.3.1	4-16	Make the following changes to Footnote 40: "Source control and sediment cleanup measures are assumed for FS modeling purposes to effectively address discrete sources of contamination, leaving sediment concentrations that are assumed to be "primarily attributable to diffuse sources, such as atmospheric deposition or storm water, not attributable to a specific source or release." WAC 173-204-505(16)."
23	4.3.3	4-20	Make the following change: "More stringent state standards must be met by a CERCLA remedial action or waived by EPA at or before completion of the remedial action. ~~The adjustment of cleanup standards for total PCBs and dioxins/furans from natural background to regional background is discussed in Appendix A.~~"
24	4.3.3.1	4-20 to 4-21	Make the following changes: "The statistical methods used to develop background concentrations are important for consistency with other regional sites and for measuring compliance. ~~Two statistical methods are presented in Table 4-2, for consistency with the LDW cleanup and the SMS ARAR. The LDW FS presented~~EPA calculates natural background concentrations based on the UCL95 from the background population, as was also presented in the LDW FS (AECOM 2012). Ecology uses an alternate method for determining natural background concentrations, which was established in agency guidance (Ecology 2017). However, EPA does not consider agency guidance to be an ARAR. EPA disagrees with the statistical method used by Ecology to determine natural background concentrations. Use of EPA's preferred statistical method results in lower values for natural background than those produced using Ecology's method. Natural background values determined using EPA's statistical method are used in this FS. ~~sets background concentrations for SMS by using the 90/90 UTL[45] from the natural background population. Furthermore, Ecology uses a collective dataset (referred to as *Bold* Plus) to establish natural background in Puget Sound. This Bold Plus dataset includes: 1) the OSV *Bold* Survey dataset (DMMP 2009); and 2) a dataset from Ecology-approved reference areas and additional areas Ecology considers similar to reference areas, as presented in Appendix I of the Sediment Cleanup Users Manual (SCUM) II (Ecology 2017). Ecology uses the Bold Plus dataset to calculate natural background, whereas the LDW FS used the OSV *Bold* Survey dataset.~~ Summary statistics for natural background calculations are presented in Table 4-2 for each of the four human health risk driver COCs."
25	4.3.3.1	4-21	Remove footnote 45.
26	4.3.3.1	4-21	Make the following changes to the "Natural Background for Arsenic in Sediment" paragraph: "Concentrations ranged from 1.1 to 21 mg/kg dw, with a mean concentration of 6.5 mg/kg dw, a 90th percentile of ~~12~~11 mg/kg dw. ~~Ecology has set natural background for arsenic at 11 mg/kg dw using the 90/90 UTL from the *Bold* Plus dataset (Ecology 2017, Table 10-1).~~ Calculating the UCL95 of the OSV *Bold* Survey dataset results in a natural background value of 7 mg/kg dw."
27	4.3.3.1	4-21	Make the following changes to the "Natural Background for Total PCBs in Sediment" paragraph: "Using the congener results, total PCB concentrations ranged from 0.01 to 10.6 µg/kg dw, with a mean of 1.2 µg/kg dw a 90th percentile of 2.7 µg/kg dw. ~~Ecology set a total PCB natural background concentration of 3.5 µg/kg dw in SCUM II.~~ Calculating the UCL95 of the OSV *Bold* Survey dataset results in a natural background value of 2 µg/kg dw."
28	Table 4-2	4-22	a) Remove the last column labeled "SMS-defined Natural Background (rounded value)[c]." b) Make the following changes to Note 1: "The summary statistics above are for the dataset collected throughout Puget Sound by DMMP in 2008 and referred to as the OSV *Bold* Survey (*Bold* dataset; DMMP 2009)~~, with the exception of the SMS background values, which are based on the *Bold* Plus dataset (Ecology 2017)~~." c) Remove the footnote 'c'. d) Remove the definition of "90/90 UTL"
29	4.3.3.1	4-23	Make the following changes to the "Natural Background for cPAHs in Sediment" paragraph: "Concentrations ranged from 1.3 to 57.7 µg TEQ/kg dw, with a mean concentration of 7.1 µg TEQ/kg dw, a 90th percentile of 15 µg TEQ/kg dw. ~~Ecology has set a natural background value of 21 µg TEQ/kg dw using the 90/90 UTL of the *Bold* Plus dataset (Ecology 2017, Table 10-1).~~ Using the UCL95 of the OSV Bold Survey dataset results in a natural background value of 9 µg TEQ/kg dw."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
30	4.3.3.1	4-23	Make the following changes to the "Natural Background for Dioxins/Furans in Sediment" paragraph: "Concentrations ranged from ~~0.2~~0.23 to 11.6 ng TEQ/kg dw, with a mean of 1.4 ng TEQ/kg dw (Table 4-2), a 90th percentile of ~~2.8~~2.2 ng TEQ/kg dw. ~~Ecology has set a natural background value of 4 ng TEQ/kg dw using the 90/90 UTL of the *Bold* Plus dataset (Ecology 2017, Table 10-1).~~ Using the UCL95 of the OSV *Bold* Survey dataset results in a natural background value of 2 ng TEQ/kg dw."
31	4.3.3.2	4-23	Make the following changes: "Regional background for a geographic area including the EW OU has not been established ~~by Ecology~~. ~~Ecology is currently developing an approach to collect additional information to establish regional background for the LDW, which may be suitable for re-evaluation of attainment of ARARs for the EW selected alternative. Appendix A discusses the justification under SMS for the adjustment of cleanup levels for PCBs and dioxins/furans based on the considerations in WAC 173-204-560(4).~~ Because regional background has not been established for the EW, the PRGs for RAO 1 (based on complying with SMS as an ARAR) are set at the SCO for both PCBs and dioxins/furans (based on natural background ~~and the PQL, respectively~~)."
32	4.3.4	4-24	Make the following change to the second paragraph: "These results reflect the range of what the laboratories were able to achieve given the composition of, and matrix complexity associated with, EW OU sediment samples. ~~In addition, Ecology has developed PQLs on a programmatic level in SCUM II (Table 11-1; Ecology 2017) that are being used at contaminated sediment sites in the State of Washington. These values can be higher than laboratory analytical quantitation limits because they also consider the limits of accuracy that can be achieved in sampling and enforcement rather than analytical methods alone.~~"
33	Table 4-3	4-25	In Table 4-3: a) Remove the column "Ecology PQL". b) Remove footnote "b". c) Remove the column "Ecology's method 90/90 UTL". d) Remove footnote "c". e) Remove the Ecology PQL and natural background values from the "Preliminary Remediation Goal" columns (i.e. 3.5 for total PCBs, 11 for arsenic, and 5 for dioxins/furans). f) Remove footnote "l". g) Remove the definition of "90/90 UTL"
34	4.4	4-29	In the first paragraph, make the following changes: "When selecting PRG(s) for each RAO, the higher value of the RAO RBTC, background, or PQL is selected. Regional background concentrations have not been established for the EW and PQLs were not found to influence selection of the PRGs (i.e., all PRGs are above PQLs)~~, but Appendix A evaluates the criteria for adjustment of the cleanup level above natural background or PQL-based cleanup levels for PCBs and dioxin/furans~~. Following completion of the final FS, upward adjustment of the cleanup level may~~can~~ occur once ~~Ecology determines~~ a regional background concentration is determined for the EW area.[46] The RAOs and PRGs are considered in selecting the RALs in Section 6 of the FS. Section 9 compares estimated concentrations of risk driver COCs following sediment remediation to PRGs as one measure of the effectiveness of the remedial alternatives."
35	4.4	4-29	Remove Footnote 46.
36	4.4	4-30	Make the following changes: "For RAO 1, the numerical PRGs for total PCBs are set to natural background because the sediment RBTCs[47] for the RME seafood consumption scenarios are below natural background. ~~Two natural background estimates are provided for total PCBs because of the differing estimates using Ecology and LDW methodology.~~ For dioxins/furans, numerical PRGs are based on natural background ~~and the PQL~~ because these values are below the sediment RBTCs for the RME seafood consumption scenarios. The natural background concentration is estimated using the LDW methodology. ~~For the Ecology method, the PQL reported by Ecology for dioxins/furans is above the natural background estimate, so the numerical PRG is provided using the PQL.~~ cPAH PRGs were not identified for the human health seafood consumption pathway (RAO 1)."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
37	4.4	4-31	Make the following changes: "The PRGs for the cPAHs are based on their RBTCs. The arsenic PRG for RAO 2 is based on natural background because the RBTCs at 1 x 10^{-6} excess cancer risk threshold are below this value. ~~Two natural background estimates are provided for arsenic because of the differing estimates using Ecology and LDW methodology.~~"
38	6.1	6-2	Make the following changes to the third bullet: "The PRGs for RAO 1 for PCBs and dioxins/furans are based on natural background ~~and PQL~~ concentrations. However, ~~as presented in Appendix A,~~ it ~~is~~may not technically possible to achieve these PRGs for these two risk drivers for the following reasons:"
39	6.1	6-3	Make the following change to the bullet: "There are constructability constraints within the EW (e.g., overwater structures and bridges~~; Appendix A~~), which affects the concentrations that can be achieved following cleanup."
40	6.2.1	6-10	Remove footnote 80: "~~Per Ecology SCUM II (Ecology 2017), t~~The lowest-apparent-effect threshold (LAET) is used as the dry weight equivalent to SQS for compounds with organic carbon-normalized criteria for samples outside of the appropriate total organic carbon range."
41	6.2.2	6-11	Make the following changes: "The total PCB and dioxin/furan PRGs for RAO 1 are based on natural background concentrations ~~and PQLs~~ in this FS. Because PRGs based on ~~either~~ natural background ~~or PQLs~~ are not expected to be achieved ~~(Appendix A)~~, RALs were developed to reduce sitewide SWACs which would, in turn, reduce associated risks for RAO 1."
42	Table 6-1	6-15	a) Remove the Ecology PQL and natural background values from the "PRG" column (i.e. 3.5 for total PCBs, 11 for arsenic, and 5 for dioxins/furans). b) Make the following changes to footnote f: "SWACs for PCBs may be higher than indicated due to mixing of sediment left behind due to structural offsets (e.g., underpier areas, keyways, and associated dredging offsets) and dredge residuals ~~(Appendix A)~~. The screening RAL of 5.0 mg/kg OC also achieved similar SWACs (Appendix L)."
43	9.1.1.2	9-3	Make the following changes to footnote 94: "~~Appendix A describes t~~The SMS compliance process indicates that~~through which~~ the selected alternative will meet the SMS ARAR over time either by meeting the PRGs in a reasonable restoration timeframe, or by adjusting the SCL upward once regional background levels are established for the geographic area of the EW and the attainment of those SCLs occurs in a reasonable restoration timeframe."
44	9.1.1.2	9-4	Make the following change to the "Model Toxics Control Act" paragraph: "Sediment sites under MTCA are regulated by the SMS, which provides risk thresholds for specified exposure pathways (e.g., 1 × 10^{-6} excess cancer risk threshold for individual carcinogens to achieve the SCO), methods for setting the SCLs ~~(analogous to PRGs in this FS)~~ to appropriate levels up to the CSL (e.g., adjusting to regional background levels), and specific target concentrations for individual chemicals for protection of the benthic community."
45	9.1.1.2	9-5	Make the following changes: "In either case, the restoration timeframe needed to meet the cleanup levels could be extended beyond 10 years, consistent with the substantive requirements of an Sediment Recovery Zone (SRZ) as defined in the SMS[95] (see Section 4.3.1~~ and Appendix A~~)."
46	9.1.1.2	9-5	Make the following changes to footnote 95: "~~As discussed in Appendix A, a~~An SRZ is used to track a cleanup area with a restoration timeframe longer than 10 years."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
47	Table 9-1	9-30	a) In the Total PCBs (top) table, make the following changes to the table header row: "Human Health PRG (Natural Background) = 2~~, 3.5~~[b]" b) Make the following changes to footnote 'b': "The ~~N~~natural background value~~s~~ presented for total PCBs is~~are~~ the UCL95 using the OSV *Bold* Survey (DMMP 2009) dataset (LDW ROD; EPA 2014) ~~and the 90/90 UTL using the "Bold Plus" dataset (Ecology 2017)~~. See Section 4 for detailed rationale." c) In the Dioxin/Furans (bottom) table, make the following changes to the table header row: "Human Health PRG (Natural Background) = 2~~ or (PQL) = 5~~[e]" d) Make the following changes to footnote 'e': "PRG~~s~~ presented for dioxins/furans is~~are~~ the natural background value (UCL95, using the OSV Bold Survey [DMMP 2009] dataset [LDW ROD]~~; EPA 2014) and the Ecology's PQL value (Ecology 2017)~~. See Section 4 for detailed rationale." e) In the Dioxin/Furans (bottom) table and in the table footnotes, remove the green highlighting indicating achievement of the PQL-based PRG. f) Remove the definition of "90/90 UTL" g) Remove the definition of "PQL"
48	Table 9-2	9-31	a) In the Arsenic (top) table, make the following changes to the table header rows: "Netfishing PRG (Natural Background) = 7~~, 11~~[b]" "Tribal Clamming PRG (Natural Background) = 7~~, 11~~[b]" b) Make the following changes to footnote 'b': "The ~~N~~natural background value~~s~~ presented for arsenic is~~are~~ the UCL95 using the OSV *Bold* Survey (DMMP 2009) dataset (LDW ROD; EPA 2014)~~ and the 90/90 UTL using the "Bold Plus" dataset (Ecology 2017)~~. See Section 4 for detailed rationale." c) In the Arsenic (top) table and in the table footnotes, remove the green highlighting indicating achievement of the arsenic background-based PRG. d) Remove the definition of "90/90 UTL"
49	9.3.1	9-33	Make the following change to the third sub-bullet under the RAO 1 main bullet: "However, the action alternatives reduce total PCB SWACs between 87% and 92% at year 40, compared to pre-construction conditions.~~ In addition, if Ecology's guidance for implementing the ARAR is followed for dioxins/furans (which is based on a PQL), PRGs may be achieved if actual concentrations fall at the lower end of incoming sediment concentrations (Section 9.15.1.2).~~"
50	9.3.1	9-33 to 9-34	Make the following change to the first sub-bullet under the RAO 2 main bullet: "All alternatives, including No Action, may meet this RAO 2 PRG in the long term, depending on incoming sediment concentrations (Section 9.15.1.2).~~ If Ecology's guidance for implementing the ARAR is followed, then all alternatives are predicted to meet and maintain the RAO 2 PRG for arsenic of 11 mg/kg dw (based on Method 90/90 UTL; Ecology 2017) in year 0 (start of construction).~~"
51	9.3.1	9-34	Make the following change to the fourth sub-bullet under the RAO 2 main bullet: "All action alternative SWACs are below the site-wide and clamming area PRG for arsenic (7 mg/kg dw) immediately after construction, and may also maintain the PRG in the long term, depending on incoming sediment concentrations (Section 9.15.1.2).~~ If Ecology's guidance for implementing the ARAR is followed, then all alternatives are predicted to meet and maintain the site-wide and clamming area PRG for arsenic (11 mg/kg dw).~~ Also, SWACs for cPAHs remain below the sitewide netfishing PRG of 380 µg TEQ/kg dw for all action alternatives in the long term."
52	9.4.1	9-50	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is not predicted to meet the natural background-based RAO 2 PRG for arsenic of 7 mg/kg dw, but may achieve this value in the long term, depending on the concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets site-wide and clamming area PRGs for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
53	9.4.5.3	9-54	Make the following change: "The No Action Alternative is not predicted to achieve 7 mg/kg dw for arsenic either sitewide nor in clamming exposure areas; however, this alternative may achieve 7 mg/kg dw in the long term, depending on the concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets site-wide and clamming area PRGs for arsenic (11 mg/kg dw) at the baseline condition and is predicted to remain below this PRG over the long term.~~"
54	Table 9-8	9-55 to 9-56	a) Make the following change in the first column: "Natural Background- ~~or PQL~~ based PRGs" b) Make the following change to footnote 'c': "No alternatives are predicted to meet ~~either~~ the natural background concentration for dioxins/furans of 2 ng TEQ/kg dw (calculated based on the UCL95 on the mean, using the OSV Bold Survey [DMMP 2009] dataset [LDW ROD]; EPA 2014)~~, nor the PQL concentration for dioxins/furans of 5 ng TEQ/kg dw (Table 11-1 of the SCUM II [Ecology 2017])~~." c) Make the following change to footnote 'd': "Alternatives 1A(12) through 3E(7.5) are predicted to meet natural background based PRG for arsenic of 7 mg/kg dw (calculated based on the UCL95; LDW ROD 2014) immediately after construction, and may maintain this value in the long term, depending on concentrations in Green River sediments. ~~All alternatives also achieve the Ecology SCUM II natural background based PRG for arsenic of 11 mg/kg dw (based on Method 90/90 UTL; Ecology 2017) and the long-term model-predicted concentration range (associated with an excess cancer risk range between 1 × 10-5 and 1 × 10-6) immediately after construction (for the action alternatives).~~" d) Remove the definition of "90/90 UTL" e) Remove the definition of "PQL"
55	9.5.1	9-59	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRGs immediately after construction completion, and it may also achieve the PRG in the long term, depending on the concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets site-wide and clamming area PRGs for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
56	9.5.2	9-61	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1 ~~and Appendix A~~)."
57	9.5.5.3	9-69	Make the following change to the first paragraph: "Alternative 1A(12) is predicted to achieve 7 mg/kg dw for arsenic by year 9 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on the concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
58	9.6.1	9-72	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
59	9.6.2	9-74	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1 ~~and Appendix A~~)."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
60	9.6.5.3	9-80	Make the following change to the first paragraph: "Alternative 1B(12) is also predicted to achieve 7 mg/kg dw for arsenic by year 9 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on net incoming sediment concentration (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
61	9.7.1	9-84	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
62	9.7.2	9-85	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1 ~~and Appendix A~~)."
63	9.7.5.3	9-92	Make the following change to the first paragraph: "Alternative 1C+(12) is also predicted to achieve 7 mg/kg dw for arsenic by year 9 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
64	9.8.1	9-96	Make the following change to the first bullet on this page: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2~~). If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
65	9.8.2	9-97	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1 ~~and Appendix A~~)."
66	9.8.5.3	9-103	Make the following change: "Alternative 2B(12) is also predicted to achieve 7 mg/kg dw for arsenic by year 10 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term~~."
67	9.9.1	9-107	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
68	9.9.2	9-108	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1 ~~and Appendix A~~)."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
69	9.9.5.3	9-115	Make the following change to the first full paragraph: "Alternative 2C+(12) is also predicted to achieve 7 mg/kg dw for arsenic by year 10 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
70	9.10.1	9-119	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2).~~ If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
71	9.10.2	9-120	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1~~ and Appendix A~~)."
72	9.10.5.3	9-126 to 9-127	Make the following change: "Alternative 3B(12) is also predicted to achieve 7 mg/kg dw for arsenic by year 10 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2).~~ If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
73	9.11.1	9-130	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
74	9.11.2	9-131	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1~~ and Appendix A~~)."
75	9.11.5.3	9-138	Make the following change: "Alternative 3C+(12) is also predicted to achieve 7 mg/kg dw for arsenic by year 10 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
76	9.12.1	9-140	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
77	9.12.2	9-143	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1~~ and Appendix A~~)."

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
78	9.12.5.3	9-149	Make the following change: "Alternative 2C+(7.5) is also predicted to achieve 7 mg/kg dw for arsenic by year 11 (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
79	9.13.1	9-153	Make the following change to the second bullet: "For human health direct contact (RAO 2) for arsenic, this alternative is predicted to achieve the netfishing and clamming PRG (7 mg/kg dw) immediately after construction completion, and it may also achieve the PRG in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction).~~"
80	9.13.2	9-154	Make the following change: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1 ~~and Appendix A~~)."
81	9.13.5.3	9-160	Make the following change: "Alternative 3E(7.5) is also predicted to achieve 7 mg/kg dw for arsenic in 13 years (immediately after construction completion) for both site-wide and clamming exposure areas, and may achieve 7 mg/kg dw in the long term, depending on concentration of incoming Green River sediments (Section 9.15.1.2). ~~If Ecology's guidance for implementing the ARAR is followed, then the alternative meets the site-wide and clamming area PRG for arsenic (11 mg/kg dw) at year 0 (start of construction) and is predicted to remain below this PRG over the long term.~~"
82	9.15.1.2	9-170 to 9-171	Remove the following paragraph: "~~The uncertainty of SWAC comparisons is further reinforced when considering analytical precision and field variability. SCUM II (Section 13.6; Ecology 2017), acknowledges that "very low concentrations may be used to establish and measure compliance with bioaccumulation-based cleanup standards and those may have significant analytical variability, as well as field variability." Based on typical analytical relative percent differences and field variability, any individual or mean value within 20% of the cleanup standard is considered indistinguishable from the cleanup standard and, therefore, the measured value is in compliance.~~"
83	9.15.1.2	9-171	Make the following changes: "For dioxins/furans, the low and high bounding range of incoming sediment concentrations is 2 ng TEQ/kg dw to 8 ng TEQ/kg dw. All active alternatives achieve the long-term model predicted concentration, which for the base case is 6 ng TEQ/kg dw. ~~However, if Ecology's guidance for implementing the ARAR is followed, a dioxins/furans PQL-based PRG may be achieved if actual concentrations fall at the lower end of incoming sediment concentrations.~~"
84	9.15.2	9-173	Make the following changes: "Dredging results in the release of contaminants to the water column (which can elevate fish and shellfish tissue contaminant concentrations over the short term) and dredge residuals to the sediment surface. ~~As described in Appendix A, f~~Full removal of all contaminated sediment is not possible in many areas near structures, where setbacks and stable slopes required for structure protection will leave some contaminated sediments behind."
85	Figure 9-1a		a) Remove the line associated with the 3.5 ug/kg dw. b) Remove the references to 90/90 UTL in the figure and figure notes.
86	Figure 9-1b		a) Remove the line associated with the 5 ng TEQ/kg dw . b) Remove the references to PQL and SCUM II in the figure and figure notes.
87	Figure 9-1c		a) Remove the line associated with the 11 mg/kg dw. b) Remove the references to 90/90 UTL in the figure and figure notes.
88	Figure 9-2a		a) Remove the line associated with the 11 mg/kg dw. b) Remove the references to 90/90 UTL in the figure and figure notes.

New Required Revisions			
Comment #	**Section #**	**Page #**	**Comment**
89	10.1.2	10-6	Make the following changes to the last paragraph: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1~~ and Appendix A~~)."
90	10.1.2	10-6	Make the following changes to footnote 149: "~~As discussed in Appendix A, a~~An SRZ is used to track a cleanup area with a restoration timeframe longer than 10 years. The requirements of an SRZ are (WAC 173-204-590(2)) consistent with the CERCLA requirements for cleanup and source control, and would be substantively met through various components of the CERCLA."
91	Table 10-1	10-10	a) Make the following changes to footnote 'l': "All alternatives, including the No Action Alternative, may meet the PRG in the long term, depending on actual site conditions. ~~All alternatives also achieve the Ecology SCUM II natural background-based PRG for arsenic of 11 mg/kg dw (based on Method 90/90 UTL; Ecology 2017).~~" b) Remove the definitions for PQL and SCUM II.
92	11.1.2	11-9	Remove footnote 158: "~~Note that the method for calculating some background and PQL values in this FS differs compared to standard Washington State methodologies presented in SCUM II (Ecology 2017). See FS Table 4-4.~~"
93	11.1.2	11-10	Make the following changes to the first paragraph: "In either case, the timeframe needed to meet the cleanup levels could be extended beyond 10 years consistent with the substantive requirements of an SRZ, as defined by SMS (see Section 4.3.1~~ and Appendix A~~)."
94	11.2	11-20 to 11-22	Change the numbering in this section to be 1 through 11.
95	11.3	11-25	Make the following change to the first sub-bullet: "Dredging results in the release of contaminants to the water column (which can maintain elevated fish and shellfish tissue contaminant concentrations over the short term) and dredge residuals to the sediment surface. ~~As described in Appendix A, f~~Full removal of all contaminated sediment is not possible in many areas near structures, where setbacks and stable slopes required for structure protection will leave some contaminated sediments behind."
96	Appendix A		Make the revisions as shown in the attached red-line/strike-out version of Appendix A.
97	Appendix B, Part 5	23 to 34	Make the following changes: "It is important to note that the lower predicted concentrations of the ranges stated above are below that which are predicted to be achieved on a site-wide basis due to removal limitations associated with structural setbacks and the presence of riprap keyways and underpier slopes~~ (see FS Appendix A, Section 4.1.1)~~. The site-wide lowest achievable total PCBs spatially weighted average concentration (SWAC) was estimated to be 57 µg/kg dw, with an effective bioavailable concentration of 34 µg/kg dw~~ (FS Appendix A)~~."
98	Appendix B, Part 5	25	Make the following change: "Note that, as discussed above, these concentrations are below the site-wide lowest possible achievable SWAC when considering constructability~~ (FS Appendix A)~~; concentrations this low may or may not be observed in a given area of the EW as part of confirmatory sampling."